MATERIAL SAFETY DATA SHEET

MSDS114

Section 1. Chemical Product And Company Identification

Ultralife Part Number:	**U2560E-5-27**
Description:	**Batt, LiMnO2, 5S1P, U2560, MOD**
Size:	**16.0 volts**
Customer Part Number:	**N/A**
Customer Description:	**N/A**
National Stock Code:	**6135-01-539-0013 U.S.** **6135-99-834-4219 U.K.**

Manufactured by	☒**Ultralife Batteries (UK) Ltd.**	☒**Ultralife Batteries, Inc.**
	18 Nuffield Way	**2000 Technology Pkwy**
	Abington, Oxfordshire, OX14 1TG, England	**Newark, NY 14513-2175**
CAGE Code	**U6734**	**0UU59**

Emergency Telephone Number:	**Chemtrec for Spills, Leaks, Fires**
USA	**1-800-424-9300**
International	**703-527-3887**
Technical Contact Telephone Number:	**1-800-332-5000**

Section 2. Composition/Information on Ingredients

Chemical Name	CAS #	Exposure Limits	Percent of Content
Manganese Dioxide, MnO_2	1313-13-9	None Listed	40 – 45
Lithium Metal, Li	7439-93-2	None Listed	1 – 3
Propylene Carbonate, $C_4H_6O_3$	108-32-7	None Listed	3 – 5
Ethylene Glycol Dimethyl Ether, $C_4H_{10}O_2$ Shipping Name: 1,2-Dimethoxyethane	110-71-4	5 ppm TWA 1ppm Preg Women	1 – 4
Tetrahydrofuran, C_4H_8O	109-99-9	200 ppm TWA	1 – 4
Lithium Perchlorate, $LiClO_4$	7791-03-9	None Listed	1 – 2
Plastic – GE Cycolac FR15U		None Listed	16-20
Remainder – Steel Can, Wire, Fuse		None Listed	22-25

Important Note: The materials in this section may only represent a hazard if the integrity of the battery is compromised or if the battery is physically or electrically abused.

Section 3. Hazards Identification

3.1 Emergency overview: May leak and /or flame if opened, recharged, connected improperly, or disposed of in fire.
3.2 Potential health effects: Skin contact may cause irritation and absorption.
Contact with raw lithium may cause burns.
Routes of entry: Inhalation or ingestion of electrolyte may have toxic effects.
Acute exposure: Electrolyte may irritate skin and eyes.
Effects of chronic exposure: Electrolyte contains a teratogen
3.3 Perchlorate Material - special handling may apply. See www.dtsc.ca.gov/hazardouswaste.

Section 4. First Aid Measures

Electrolyte Contact
Skin- Immediately flush with plenty of water for at least 15 minutes. If symptoms are present after flushing, get medical attention.
Eyes- Immediately flush with plenty of water for at least 15 minutes and get medical attention.
Lithium Metal Contact
Skin- Remove particles of lithium from skin as rapidly as possible. Immediately flush with plenty of water for at least 15 minutes and get medical attention.
Eyes- Immediately flush with plenty of water for at least 15 minutes and get immediate medical attention.

Section 5. Fire Fighting Measures

Extinguishing Media:
Copious amounts of cold water are an effective extinguishing medium for lithium batteries. Do not use warm or hot water.
Do not use Halon type extinguishing material.
Fire Fighting Procedures
Use a positive pressure self-contained breathing apparatus if batteries are involved in a fire.
Full protective clothing is necessary.
During water application, caution is advised as burning pieces of lithium may be ejected from the fire.
Unusual Fire and Explosion Hazards
Batteries may flame or leak potentially hazardous organic vapors if exposed to excessive heat or fire.
Hazardous combustion products
Fire or excessive heat may produce hazardous decomposition products.
Damaged or opened batteries can result in rapid heating and the release of flammable vapors. Vapors are heavier than air and may travel along the ground or be moved by ventilation to an ignition source and flash back.

Section 6. Accidental Release Measures

Damaged batteries that are not hot or burning should be placed in a sealed plastic bag or container.

Section 7. Handling And Storage

Do not store batteries in a manner that allows terminals to short circuit.

Batteries should be separated from other materials and stored in a non-combustible, well ventilated, sprinkler-protected structure with sufficient clearance between walls and battery stacks. Do not place batteries near heating equipment, nor expose to direct sunlight for long periods

Batteries should be stored in a dry area at temperatures no higher than 85°C (194°F). Air conditioning or cooling is not required unless excessively high temperatures above 90°C (194°F) will be encountered. Elevated storage temperatures above 72°C (162°F) can result in reduced battery shelf life and service life, and should be avoided. Batteries should be kept as cool as possible in order to maximize shelf life and service life.

Batteries are not designed to be recharged. Charging a battery may result in electrolyte leakage and/ or cause the battery to flame.

Never disassemble a battery.

Should a battery unintentionally be crushed, thus releasing its contents, rubber gloves must be used to handle all battery components. Avoid inhalation of any vapors that may be emitted.

In the event of skin or eye exposure to the electrolyte, refer to
Section 4, First Aid Measures.

More than a momentary short circuit will generally reduce the battery service life. Batteries with fuses will no longer be functional after being shorted.

Extended short circuiting creates high temperatures in the cell. High temperatures can cause burns in skin or cause the cell to flame.

Avoid reversing battery polarity within the battery assembly. To do so may cause cell to flame or to leak.

The use of old and new batteries or batteries of varying sizes and types in the same battery assembly should be avoided. The batteries' electrical characteristics and capabilities vary and damage may result to batteries or electrical equipment.

Section 8. Exposure Controls/Personal Protection

No engineering controls are required for handling batteries that have not been damaged. Personal protective equipment for damaged batteries should include chemical resistant gloves and safety glasses. In the event of a fire, SCBA should be worn along with thermally protective outer garments.

Section 9. Physical And Chemical Properties

Not Applicable

Section 10. Stability And Reactivity

(1) This product is stable under ordinary conditions of use and storage.
(2) It is not recommended that this product be stored above 85°C (194°F).
(3) Damaged batteries will react with water. Non-discharged batteries contain elemental Lithium. This is water reactive. This reaction gives off heat and hydrogen gas. A thermal reaction may occur.
(4) Hazardous decomposition products: Carbon Monoxide (CO), and Hydrogen Flouride (HF)

Section 11. Toxicological Information

(1) Irritancy: The electrolytes contained in this battery can irritate eyes with any contact. Prolonged contact with the skin or mucous membranes may cause irritation.
(2) Sensitization: No information is available at this time.
(3) Carcinogenicity: No information is available at this time.
(4) Reproductive toxicity: No information is available at this time.
(5) Teratogenicity: This product contains a known teratogen as indicated in the chemical information in section 2.
(6) Mutagenicity: No information is available at this time.

Section 12. Ecological Information

Not applicable to this material/product.

Section 13. Disposal Considerations

Batteries must be completely discharged prior to disposal and/ or the terminals must be taped or capped to prevent short circuit. This product does not contain any materials listed by the United Stated EPA as requiring specific waste disposal requirements. When completely discharged it is not considered hazardous. Disposal of large quantities of lithium power cells may be subject to Federal, State, or Local regulations. Consult your local, state and provincial regulations regarding disposal of these batteries.

Section 14. Transport Information

Ultralife's lithium metal primary cells and batteries and lithium ion cells and batteries are classified and regulated as Class 9 dangerous goods (also known as "hazardous materials" in the United States) by the International Civil Aviation Organization (ICAO), International Air Transport Association (IATA), International Maritime Organization (IMO) and many government agencies such as the U.S. Department of Transportation (DOT). These organizations and agencies publish regulations that contain detailed packaging, marking, labeling, documentation, and training requirements that must be followed when offering (shipping) Ultralife's cells and batteries for transportation. **However, small cells and batteries are not subject to certain provisions of the regulations (e.g., Class 9 labeling and UN specification packaging) if they meet specific requirements**. The regulations are based on the UN Recommendations on the Transport of Dangerous Goods Model Regulations and the UN Manual of Tests and Criteria. **These regulations also apply to shipments of cells and batteries that are packed with or contained in equipment.** Failure to comply with these regulations can result in substantial civil or criminal penalties.

Cell and Battery Testing Requirements

The dangerous goods regulations require that each cell and battery design be subject to tests contained in Section 38.3 of the UN Manual of Tests and Criteria prior to being offered for transport. Ultralife's cells and batteries have been tested and comply with all of the UN testing requirements. **Batteries or battery packs constructed from Ultralife's cells must be subjected to tests contained in the UN Manual of Tests and Criteria.**

Additional Information

UN Recommendations on the Transport of Dangerous Goods Model Regulations

IATA Dangerous Goods Regulations

International Maritime Dangerous Goods Code

European Road Regulations (ADR)

U.S. Hazardous Materials Regulations

For more information, please refer to the Transportation Regulations Page on Ultralife's Web Site:

http://www.ultralifebatteries.com/engineers.php?ID=137

(1) Product is shipped as:

Ground (DOT)	Air (IATA/ICAO)	Water(IMDG)
(Non-Hazardous)	UN3090	UN3090
	Lithium Batteries	Lithium Batteries
	Class 9, PG II	Class 9, PG II

(2) Special shipping information: This battery has been tested to Section 38.3 of 'UN Manual of Tests and Criteria'. These batteries should be placarded and labeled as defined in DOT, IATA and IMDG regulations based on mode of transportation.
These batteries cannot be shipped on passenger aircraft.

Section 15. Regulatory Information

USA: This MSDS meets/exceeds OSHA requirements.
Canada: This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.
International: This MSDS conforms to European Union (EU), the International Standards Organization (ISO) and the International Labour Organization (ILO) and as documented in ANSI (American National Standards Institute) Standard Z400.1-1993.

Section 16. Other Information

The information contained herein is furnished without warranty of any kind. Users should consider this data only as a supplement to other information gathered by them and must make independent determinations of the suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers.